To: Biosolids Expert Panel Members
From: Henry J. Staudinger, Citizens' Representative
Alan Rubin, Envirostrategies, LLC
Re: Recommendations for the Panel
Date: August 6, 2008

Land application is one of several EPA and Commonwealth of Virginia (State) regulated management practices for biosolids (sewage sludge). Biosolids results from the removal of constituents from municipal wastewater by sewage treatment plants before the treated wastewater may be discharged into the aquatic environment.

Both Federal and State biosolids regulations have deficiencies with respect to protecting "pollution sensitive" individuals residing in close proximity to biosolids land application and storage sites as well as protecting both human health and the environment at "pollution sensitive" sites.

A number of citizens residing in close proximity to biosolids land application and storage sites have long complained of negative health impacts (in some cases serious illnesses) following exposure to biosolids. These citizens have reported a host of negative human health symptoms which they have attributed to both short and long term exposure to either stored or land applied biosolids. Because of these reported health impacts, many want the land application of biosolids management option banned.

Citizens exposed to biosolids believe that they are experiencing or have experienced adverse health impacts and have clearly and demonstrably stated that they are experiencing negative health symptoms. Prudent public policy, therefore, demands that the regulatory authority in the Commonwealth of Virginia expeditiously take steps to ameliorate/eliminate this situation.

As this panel has discovered, it is currently impossible to determine many of the constituents in any given biosolids; and there are no studies that can identify the nature of the risk and the potential impact to health in the absence of biosolids constituent information. This panel does not possess the ability to determine the causative agent(s), (aerosols, allergens, odorants, dusts, or even psychosomatic factors) if any, for the symptoms described by citizens.

Close proximity to biosolids is at the core of health complaints. That is an area that this Panel can provide useful recommendations to the General Assembly. The Federal Part 503 regulation clearly states that the States have the authority to increase the stringency of the Part 503 Standards and/or add additional requirements to their State standards in order to increase the protection of human health and the environment for these "pollution sensitive individuals" and "pollution sensitive sites".

We believe it possible for the Panel to develop consensus recommendations that, if adopted and implemented, would address many of the health concerns by substantially reducing exposure of the public to biosolids constituents, thereby making the management of biosolids by land application less objectionable and thus a more viable option in the state.

Adoption of the following recommendations by the General Assembly and subsequent conversion of these recommendations into State biosolids regulations that are fully implemented and enforced will strengthen the State's biosolids regulatory program based on sound science, increase the margin of safety in the protection of public health and the environment, give relief to the citizens described below, reduce the potential for liability and tort claim actions, and reduce objections of the public to land application as a viable management option for biosolids in the Commonwealth of Virginia.

I. Modify the 400 foot Minimum Buffer Regulatory Requirement for Odor Sensitive Receptors to Apply to Odor and Health Sensitive Individuals and Require same Day Incorporation Within One-Half Mile of an Occupied Residence when Such Individuals are Present.

Current regulations provide for a minimum 400 foot buffer where odor sensitive receptors are present. Those regulations were prompted by legislation adopted in response to citizens' requests to assure more realistic buffers to address nuisances. However, the implementing regulations were severely limited by VDH's determination that "receptors" would be limited to buildings such as schools, effectively denying this protection to most odor sensitive individuals. Thus a child at school is afforded this protection, but a child at home is not. This should be corrected by clearly including odor and health sensitive individuals within the definition of odor sensitive receptors.

Unincorporated biosolids are most likely to result in nuisance and/or health complaints. To further reduce the risk, it is recommended that all biosolids not injected within one-half mile of occupied dwellings should be incorporated on the same day that an application is made in all situations addressed in the following Recommendations 1-3.

Recommendation # 1

> The General Assembly should require minimum 400 foot buffers between biosolids and odor sensitive "receptors", with receptors to include odor sensitive individuals and individuals described in Recommendation # 3.

Recommendation # 2

> The General Assembly should require that biosolids land applied within one half mile of any occupied building be (1) injected or (2) incorporated into the receiving soil via disking or plowing on the same day of application where individuals described in Recommendations # 1 and # 3 are present.

II. Exposure of the Seriously Ill and those Who Become Ill Following Exposure to Biosolids

During Panel meetings there seemed to be full agreement that of paramount importance is that the seriously ill should be protected from exposure to biosolids constituents via transport through

air. We believe it would be prudent public policy for the General Assembly to adopt legislation that would do just that. Medical conditions that merit this protection from exposure to biosolids constituents should be made by members of the medical profession. Until then as a start, we urge the medical personnel on this Panel to identify for this section of the Report medical conditions to be recommended to the General Assembly.

Sensitivities of individuals vary – e.g. peanuts can be fatal to some individuals, but serve as healthy food for others. Thus there are individuals that may become ill following involuntary exposure to biosolids that cannot be identified in advance. Individuals who become ill following exposure to biosolids should be protected from further exposure. Medical professionals, with special reliance on recommendations from attending physicians, should be relied on by DEQ when determining who should not be further exposed.

The policies and practices (including informed notice to those residing near application sites) to identify individuals who should not be exposed are not in place. Thus we have included recommendations # 4 and # 5.

Recommendation # 3

> The General Assembly should preclude exposure to airborne biosolids constituents the following individuals: (1) those with medical conditions that put them as special risk (including by way of example: _____) and (2) those who become ill following exposure to biosolids. In determining who should not be exposed, DEQ should be guided by the medical profession, especially attending physicians who recommend no exposure.

Recommendation # 4

> The General Assembly should require that adequate notice of a planned biosolids land application project be provided to those potentially exposed so those protected by Recommendation # 3 are properly identified.

Recommendation #5

> The General Assembly should require DEQ policies and practices that assure that individuals who believe they have become ill following exposure to biosolids are evaluated and further exposure precluded based on the Requirements set forth in recommendation # 3.

III. Provide Adequate Resources to Enable DEQ to More Adequately Protect Public Health and the Environment.

The failure of the Virginia Department of Health (VDH) to address the health concerns and complaints of Virginia citizens residing in close proximity to biosolids storage or land application sites was an important factor in the decision of the General Assembly to transfer permit authority from VDH to DEQ. However, DEQ has made it clear that it does not have the

expertise, much less the funding or resources, needed to address health issues related to land applied biosolids. VDH has not demonstrated the willingness to provide the needed recources. If biosolids are to continue to be land applied, it is essential that the General Assembly address this deficiency.

Recommendation # 6

> In the absence of adequate assistance from VDH, the General Assembly must provide funding and resources sufficient to enable DEQ to otherwise carry out its important mandate to protect public health and the environment when biosolids are land applied, and to assure compliance with Recommendations #s 1-5.

IV. Assure Enforcement of Applicable Laws and Regulations

Inadequate enforcement of existing biosolids regulations has long been the subject of complaints. This is often described as an issue of priorities. All regulatory provisions, especially those that could impact human health, must be enforced if land application is be a viable biosolids management option. The Panel's consensus position should be that all Federal and Virginia regulations for the land application of biosolids should be rigorously enforced at all times.

Based on past experience, the public has little expectation that this will occur without a clear directive from the General Assembly. The March 31, 2008, memo from Henry Staudinger addressing this issue set forth an example of this failure to be considered by the Panel.

> "The primary agronomic value of biosolids, the nutrient content, shall be established prior to agricultural use. The applied **nitrogen and phosphorous content of biosolids shall be limited to amounts established to support crop growth**…." [Emphasis Added.] 12 VAC 50-585-550(A) [currently 9 VAC 25-32-600]

There are several reason to assure compliance of the NP&K agronomic rates (to include supplementation of K shortages), including: (1) Reduced aerosols constituents that the public can be exposed to; (2) Compliance with good recycling practices; and (3) reduced pollution of the waters of Virginia, including the Chesapeake.

DEQ's failure to confirm that it would enforce those requirements suggests that without a clear mandate from the General Assembly, VDH's prior non-enforcement policy may continue based on "priorities". From the perspective of those exposed to land applied biosolids, enforcement of these nutrient management requirements would reduce the amount of biosolids constituent exposure, an important consideration for those who have become ill following exposure to biosolids.

During panel discussions, some suggested that DEQ could disregard the agronomic rates for P as long as DCR's less protective phosphorous limitations were complied with. It is submitted that this is not a good recycling practice. Moreover, Generators have been required to spend considerable funds at their facilities to reduce P flow into the Chesapeake Bay. It makes little

sense turn around and allow some of that same P to return to the Chesapeake Bay even if there were no other reasons to limit P to agronomic rates.

The second reason advanced for not strictly adhering to the above referenced VAC was that this would reduce the amount of free nitrogen to farmers currently receiving biosolids and, thereby, discourage their continued use of biosolids. However, this argument flies in the face of information provided to the Panel by Greg Evanylo and a number of farmers who addressed the tremendous increase in the cost of chemical-based fertilizer. Strict enforcement of an agronomic rate policy premised on the above referenced VAC would provide somewhat reduced amounts of free nitrogen per farmer currently receiving biosolids but this would be more than compensated for by an increase in the number of farmers who would now be able to participate in biosolids land application programs to receive free nitrogen and free available phosphorous for their crops. In summary, this good recycling practice would provide the financial benefit of biosolids land application to more farmers.

To make certain that past enforcement failures do not continue, the General Assembly should authorize others to take appropriate action where there are persistent violations of State biosolids regulations, including agronomic rates, spills ,buffers, biosolids quality, treatment technology, and compliance standards (e.g., metals, organic chemicals (if applicable), microbe and pathogen content/pathogen reduction-elimination treatment technology requirements, vector attraction reduction requirements, and monitoring, recordkeeping, and reporting requirements). We have offered a way to address that problem --the right of local governments to prohibit future land application of biosolids from the offending biosolids generator(s) and/or land application companies operating in their jurisdictions where there are persistent violations and on sites where those violations occurred.

Recommendation # 7

> The General Assembly should require that DEQ enforce all provisions of the biosolids regulations and underlying statutes, including by way of example, preclusion of exposure of individuals covered by Recommendations #s 1-5, supplementation of K shortages, and limiting P to crop needs.

Recommendation # 8

> Where there are persistent violations of the biosolids regulations and underlying statutes by a permittee, no further biosolids from the generator may be land applied in Virginia and no further land applications of biosolids in Virginia may be made by the applicator.

Recommendation # 9

> Where there are persistent violations of the biosolids regulations and underlying statutes by a farm operator, all sites owned and/or operated by such farm operator should no longer eligible for land application of biosolids.

Recommendation # 10

> The General Assembly should further provide that where there are persistent violations of Federal and/or State biosolids regulations with respect to full compliance and enforcement of said biosolids regulations, other governmental jurisdictions such as county governments shall have the right to prohibit future operations of the offending biosolids generator(s) and applicator(s) if DEQ fails to enforce Recommendations # 8 and # 9.

V. Exclusion of Pollution Sensitive Sites

Although current State regulations prohibit land application of biosolids on certain pollution sensitive sites, they have been designed primarily to protect the environment from excessive nutrients and in a number of situations are inadequate to accomplish even that limited objective. They were not designed to protect human health from exposure to other constituents that may be present in biosolids.

Pollution Sensitive Sites would include sites from which individuals with the proposed medical conditions set in Recommendation # 3 could be put at risk as well as sites that put groundwater, especially drinking water for rural Virginians (Karst terrain, etc), and surface water quality at risk. DEQ should be required to evaluate other characteristics that would qualify a site as pollution sensitive. All sites described in the Virginia Department of Conservation and Resources (DCR) regulations as environmentally sensitive should be excluded. Pollution Sensitive sites should also include sites with slopes in excess of 7%. EPA's risk assessment assumed that slopes would not exceed 6%. DEQ allows slopes up to 15%). As a precondition to biosolids land application at a particular site, the permittee should be required to certify that the site is not a pollution sensitive site.

Recommendation # 11

> The General Assembly should require that all pollution sensitive sites be identified and land application of biosolids on such sites be prohibited. These sites would include by way of example, sites that may affect individuals described in Recommendations #s 1-5 and all sites defined by DCR as "environmentally sensitive", including sites with slopes in excess of 7%.

VI. Require Generator Participation as Permittees in the Land Application Process and Require an Environmental Management Systems for Biosolids

It is unlikely that biosolids regulations (or any environmental regulation for that matter) can be designed to fully protect the health of the most vulnerable individual and every environmental specie. The land application option is important to generators, but they have a special responsibility to avoid harm to human health and the environment when they manage their biosolids through land application or other biosolids management practices that they choose. Indeed the Federal Part 503 Biosolids Standards make generators responsible for the execution

of the entire Part 503 Rule, even the execution of those Part 503 provisions that are the responsibility of the land appliers that they employ.

Because of this special status and responsibility that biosolids' generators have for compliance with the entire biosolids rule at the Federal level and their separate responsibility to land apply without causing harm, generators should be required to play a direct role in evaluating local health concerns and, from this role of evaluation, preclude or at least modify biosolids land application operations through their land application contractors to reduce and/or eliminate exposure to biosolids constituents where there may be legitimate health concerns.

This could be accomplished through the incorporation of a meaningful Environmental Management System (EMS) into the generators biosolids management program. Currently a national EMS program developed and implemented by the National Biosolids Partnership (NBP) exists. However, at this time, we are unable to endorse the NBP program as one that is fully effective in addressing the health concerns of citizens residing in close proximity to biosolids land application sites until we are assured of the effectiveness of these EMS programs to address these health concerns. It is possible that the Commonwealth of Virginia Environmental Excellence Program (VEEP) as administered by DEQ could be modified as a biosolids EMS program with the requisite effectiveness to address these health concerns.

Recommendation # 12

> The General Assembly should require that all biosolids generators whose biosolids are land applied in Virginia, whether in State or out of State, be permit holders when their biosolids are land applied.

Recommendation # 13

> The General Assembly should require all permittees to employ a meaningful EMS program within five years of incorporation of this recommendation into legislation.

VII. Certifications by Land Applicators

Compliance is the responsibility of the Permittee. Verification of compliance is often a difficult task, dependent in large part on the availability of State or local inspectors. To reduce that burden and to maximize compliance, there should be annual certifications by permittees that they were in compliance with all applicable laws. Should there have been a violation(s), such violations should be identified, explained and a plan described to avoid similar violations in the future.

Recommendation # 14

> The General Assembly should require an Annual Certification of Compliance by all Permittees. Where compliance deficiencies are noted, the Permittes shall describe what steps have been taken to avoid ~~a~~ similar violations in the future.

VIII. Evaluation of Alternative Biosolids Management Technologies

A specific recommendation will be made when more information has been collected by the panel.